

RESEARCH IMPLEMENTATION REPORT – 2010

ADOT RESEARCH CENTER

October 2011



Arizona Department of Transportation

Research projects SPR-576 and SPR-677: US 93 Bighorn Sheep Movement/Connectivity Study

The first of these studies (SPR-576) was performed between 2004 and 2006 and published in 2007. Data collected during this study provided a good understanding of the movement of wildlife on both sides of US Route 93 between mile post (MP) 3 and MP 17. A key outcome of this study was the identification of three favorable locations for wildlife overpasses, which were subsequently recommended to the Arizona Department of Transportation (ADOT). The second study (SPR-677), which is in the data analysis and report preparation stage (October 2011), continued the monitoring of wildlife before overpass construction started through the construction period for the three wildlife overpasses.

The specific objectives of the latest US 93 research effort include:

- Assess desert bighorn sheep movement and highway crossing patterns and distribution relative to US 93, and assess permeability (passage rates) across the highway corridor before and during overpass construction.
- Investigate the relationships of desert bighorn sheep highway crossing and distribution patterns to vehicular traffic volume before and during overpass construction.
- Investigate wildlife-vehicle collision patterns along US 93 before and during construction.
- Assess the impact of US 93 highway construction activities on desert bighorn sheep movements and behavioral patterns and develop mitigation strategies to minimize these impacts.

Implementation

The three wildlife overpasses were completed recently. Cameras installed as part of the monitoring effort have already captured images showing groups of animals on the overpasses completing successful crossings. For the 2012 fiscal year, the research council approved a follow-up research project to monitor and evaluate the effectiveness of the wildlife overpasses on US 93. ADOT expects to work with the Arizona Game and Fish Department (AGFD) to develop a study plan for this effort and execute a joint project agreement for a smooth transition into this new phase of the overall effort.



In June 2011 the Federal Highway Administration (FHWA) announced designations for Exemplary Human Environment Initiatives (EHEI) and Exemplary Ecosystems Initiatives (EEI) for 2011. Arizona's US 93 wildlife connectivity effort, of which the research projects

are a major part, was one of 12 projects across the country in the EEI category designations. The designation statement states as follows; “Arizona: US 93, Hoover Dam to MP 17, for creating innovative solutions to wildlife crossing and ecosystem connectivity issues as part of the development of a multi-lane highway”.

Research Project SPR-619:

[**Assessment of Pronghorn Movements and Strategies to Promote Highway Permeability, US 89 \(Published in 2011\)**](#)

Of all North American ungulate species, the barrier effect associated with highways appears to affect no species as much as it does pronghorn. The fragmentation of pronghorn herds by highways has contributed to isolation of populations and disruption of seasonal migrations, resulting in reduced pronghorn populations. While passage structures have proven effective for other wildlife species, their application to promote pronghorn highway permeability has been limited. The goal of this research project was to apply insights gained from pronghorn movements and crossings of the highway to develop strategies to enhance permeability as part of future highway reconstruction.

Implementation

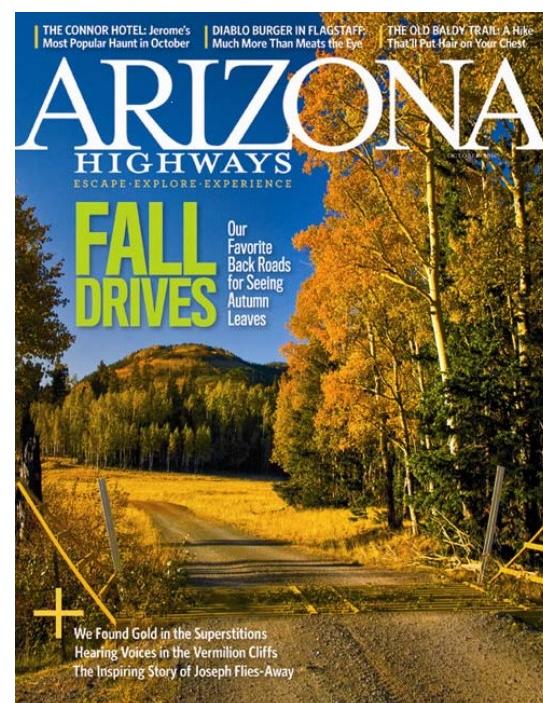
The final report recommendations identified ideal locations for crossing structures along US Route 89. Subsequently, the environmental assessment for this highway corridor provides that crossing structure(s) will be considered to mitigate pronghorn population fragmentation. These recommendations may be implemented during final design. Additionally, the research indicated that the combination of fences and roads severely limit pronghorn movements. ADOT, AGFD, and the National Park Service worked together to modify and remove some fencing along US 89. Follow-up by AGFD showed a dramatic increase in the ability of the pronghorn to get across the road.

Research Project SPR-686:

The Impact of Arizona Highways Magazine on Tourism (completed but not yet published)

This research identified and analyzed the effect that Arizona Highways Magazine (AHM) has on tourism in Arizona. It is often assumed that travel-oriented publications such as AHM have substantial effects on people's decisions to travel to particular destinations. However, while the effect of promotional efforts on travel decisions is becoming fairly well understood, the influence of more informal information sources, such as magazines, has not been investigated to any great extent. This study was an update and extension of a similar study done in 2004. The specific purpose of this update was to:

- Examine the effect of Arizona Highways Magazine on tourism to and in Arizona
- Determine trip characteristics of Arizona Highways Magazine subscribers traveling in Arizona, and
- Calculate a benefit/cost ratio for Arizona Highways Magazine based on the magazine's expenditures and revenues, as well as the value-added economic impact to Arizona's economy due to its influence on travel.



Implementation

One of the recommendations of the study was that quantitative information on AHM's impact on the tourism economy be shared with key stakeholders. It is noted in this regard that AHM delivers research results to legislators, the media, and other stakeholders. Messaging focuses on the significant economic benefit of AHM to the private sector, including tax-paying businesses and individuals, while receiving no state funding.

Another recommendation sought to amend press releases and sponsorship materials to focus on AHM's annual economic impact, publicizing specific research findings for appropriate and relevant audiences. In this respect, the magazine publisher incorporates research results into presentations to service organizations, business organizations, community groups, and general audiences. Presentations are scheduled approximately four times per month.

The study also recommended that further research be considered to assess the influence of social media efforts. A small budget study on the impact of AHM's Facebook page has been approved by the Research Council. Scope development for this new effort is underway.

Research Project SPR-646

AASHTOWare Turbo Relocation Software Development

Payment of relocation benefits for property owners is mandated by federal regulation and state law. A relocation software package was developed to provide agencies with the ability to allocate scarce resources to carry out relocation calculations and documentation that meet both federal and state requirements in a consistent manner.

The project was conducted in two phases. The first phase (\$90,000) entailed cooperation in a multi-state pooled-fund effort to develop a web-based application that is easy to implement (i.e., has low in-house IT resource requirements) and has the ability to create reports for both state and federal reporting requirements. The second phase (\$10,000) entailed implementing the results of phase 1 by customizing the model to ADOT's actual needs. Phase 1 was managed by AASHTO and conducted with financial participation from several states.



Implementation:

The pooled-fund study, with AASHTO as the lead partner, developed software to assist states in determining, reviewing, and processing payments for the relocation of property owners. The software was customized for ADOT use and is presently in the early stage of implementation. The ADOT Right-of-Way (ROW) section will use the software to manage upcoming relocations. ROW agents have been trained in its use.

Research Project SPR-660:

Arizona Transportation History (completed but not yet published)

The project resulted in a detailed narrative of the history of transportation in Arizona from pre-Columbian times to the present. Although all modes are represented, the history focuses on the development of the state highway system. The report includes a series of engaging essays on topics such as the history of ADOT, US Route 66, and Arizona's bridges, as well as a timeline of transportation history within the context of national and world events. While the report is primarily text, several historic maps enhance understanding of the growth of the transportation system.



Implementation:

The Arizona Transportation History project was initiated in anticipation of Arizona's centennial in 2012. As the first-ever document of its kind, it is likely to be of interest to students, educators, historians, and the general public. Discussions are underway on the possibility of transforming the research report into a colorful "coffee-table" book through collaboration with Arizona Highways Magazine. In addition, the Arizona Rural Transportation Summit scheduled for January 2012 will feature a presentation on the project.